INXN DUB15/16

Proposed Attenuation Catchment Area Report

280503-00

Clarification on Planning RFI Response | 24 May 2022

Job number 280503-00

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Document Verification

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Job title		INXN DUB15/16		Job number 280503-00
Document title		Proposed Attenuation Catchment Area Report		File reference
Document ref		280503-00		
Revision	Date	Filename	INXN_DUB1516_Surface Water Report_Planning RFI Response	
Clarification on Planning RFI Response	24 May 2022	Description	Clarification on Planning RFI Response Issue	
			Prepared by	Checked by	Approved by
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		Filename			
		Description			
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		Name			
		Signature			
				Issue Document Verification with Document	✓

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Appendices

1 Introduction

This report was produced following South Dublin County Council clarification request regarding documents provided as part of planning further information submission under Register Reference SD21A/0217 lodged by Digital Netherlands VIII B.V. for the extension of the existing facility (DUB13/14) at Profile Park, Nangor Road, Clondalkin, Dublin 22.

2 Existing Surface Water Attenuation System

The existing DUB 13 and DUB14 Data Centres are served by a surface water drainage network which collects run-off coming from the existing buildings and surrounding hardstanding areas. The related surface water system runs by gravity from the rear of the existing buildings eastwards, combining into one outfall point and discharging at a controlled rate into an existing watercourse which traverses the site from south to north. The related surface water network incorporates four existing attenuation facilities totalling an approximate storage volume of 826 m3, which will all be maintained. Also, there is another existing attenuation system of approximately 128 m3 meant to cater for future development of the site, development which has now become the object of this planning application. Thereby, the existing 128 m3 facility will be removed and has being superseded by the new proposed surface water scheme.

No run-off from the existing development area will be catered by the Proposed Attenuation Pond. All the run-off from the existing DUB13 and DUB14 buildings and surrounding areas will be catered by the retained existing attenuation facilities.

3 Proposed Drainage

Drainage from the proposed DUB 15 and DUB 16 development shall be drained by a completely separate system from the existing, with separate foul drains and surface water drains and swales. The outfall of the proposed surface water system will discharge into the watercourse, immediately downstream of the end of the proposed watercourse realignment.

After completion of the proposed development, the existing watercourse currently traversing the site will be limited to its segments in front the existing DUB13 and DUB14, thereby catering exclusively for surface water run-off coming from those existing buildings and immediate surroundings.

Surface water discharges from the proposed site will be restricted, with flows in excess of the allowable discharge rate being retained on site for storms up to and including the 1 in 100-year event plus 20% climate change allowance, mostly by one single above ground attenuation pond, supported by multiple SuDS features and related pipes network.

3.1 Proposed Surface Water Attenuation System

All the surface water run-off from the proposed development and buildings shall drain by gravity via different SuDS features and pipes network towards the attenuation pond to the northeast of the site, which works as the main attenuation facility of the proposed site, exclusively, not allowing for any discharge from the existing buildings and related existing drainage system. The type of SuDS is dependent on the location of each system and specific characteristics of their surrounding areas.

The proposed attenuation pond is comprised of Hydrobrake flow restricting device limiting the discharge to greenfield run-off rates and approximately 300mm high standing water pool prior to its final outfall discharge.

The allowable outflow from the development will be restricted to greenfield run-off rate as outlined below on Item 3.1.1. Flows in excess of the allowable discharge rate will be stored on site, mostly in the form of storm attenuation pond but not limited to that given different types of SuDS features are proposed to provide limited attenuation storage and mainly improve the quality of waters discharging into the receiving surface water systems.

3.1.1 Storm Attenuation and Online Control

As outlined in detail on "INXN_DUB1516 Surface Water Report" produced as part of the response to the Request of Further Information, the required attenuation volume for the site has been calculated based on the parameters listed below:

- Total Catchment Area of 4.053 hectares
- Total Impermeable Area of 3.294 hectares
- Qbar of 1.99 l/s/ha (as per FI request)
- Total Allowable Discharge from the site of 8.06 litres per second

The break-out of the catchment areas according to the different types of surfaces is outlined on Table 1.

Attenuation Pond Catchment Area Summary		
Total Catchment Area	**4.053**	ha
Total Impermeable Area	**3.294**	ha
Qbar	**1.99**	l/s/ha
Hydrobrake discharge limited to	**8.06**	l/s
Areas brake up	**m2**	**Runoff coefficient**
Roof	15213.0	1.00
Green Roof	1832.1	0.40
Road	4989.2	1.00
Concrete	5793.8	1.00

Footpath	1868.4	0.95
Permeable Carpark	1097.6	0.50
Landscape	9743.4	0.40
	40537.5	**0.81**

Table 1 - Attenuation Pond Catchment Area Break-out by each type of surface

Run-off originated from the roofs of both DUB 15 and DUB 16 Administration Buildings will be collected via Green Roofs, whilst via standard roof drainage system for both DUB15 and DUB16 Data Buildings. Their run-off will discharge downstream into By-pass Petrol Interceptor via pipes network, from which will ultimately discharge into Attenuation Pond via pipes network.

Run-off originated from the majority of the roads and surrounding areas will be collected via Roadside Swales, discharging downstream into By-pass Petrol Interceptor via pipes network, from which will ultimately discharge into Attenuation Pond via pipes network.

For the refuelling areas of the generator yards and buildings loading bays, standard drainage collection systems such as gullies and aco drains will be provided, from which will discharge downstream into Full Retention Petrol Interceptors via pipes networks, then run through By-pass Petrol Interceptor and ultimately discharge into Attenuation Pond via pipes network.

Run-off from Permeable Carparks and immediate surrounding areas will be collected via porous pavement then discharge downstream into either By-pass Petrol Interceptor or Proprietary Surface Water Treatment System via overflow drains and pipes network, from which will ultimately discharge into Attenuation Pond via pipes network.

The proposed storm attenuation pond is located at the northeast corner of the site and is designed to store a volume with equivalent storage for a 1 in 100-year storm event plus 20% allowance for climate change for the majority of the run-off from the proposed development, totalling 2424.7 m3 of storage provided by the pond. All SuDS features will also support in attenuating run-off for storms up to and including the 1 in 100-year plus 20% climate change. Green roofs will provide a total attenuation volume of 74.84 m3, Roadside Swales will provide a total attenuation volume of 54.54 m3, Permeable Paving can provide a total attenuation volume of 98.30 m3, Full Retention Petrol Interceptors can provide a total attenuation volume of 49.35 m3, By-pass Petrol Interceptor can provide a total attenuation volume of 4.49 m3, totalling **2708.8 m3** of overall attenuation volume provide by the proposed SuDS features of the proposed development.

The Total Attenuation Volume required for the site is **2498.0 m3**. This is the maximum volume required for a Storm Event of 100-yr return period + 20% of climate change allowance and Duration of 2880 minutes (48-hr). Please refer to Appendix B on Surface Water Report submitted as part of the further information documents submission for details on Qbar calculation, M5-60, r, SAAR, etc. Also, page 30 of same report for calculation on Storage Volume Required.

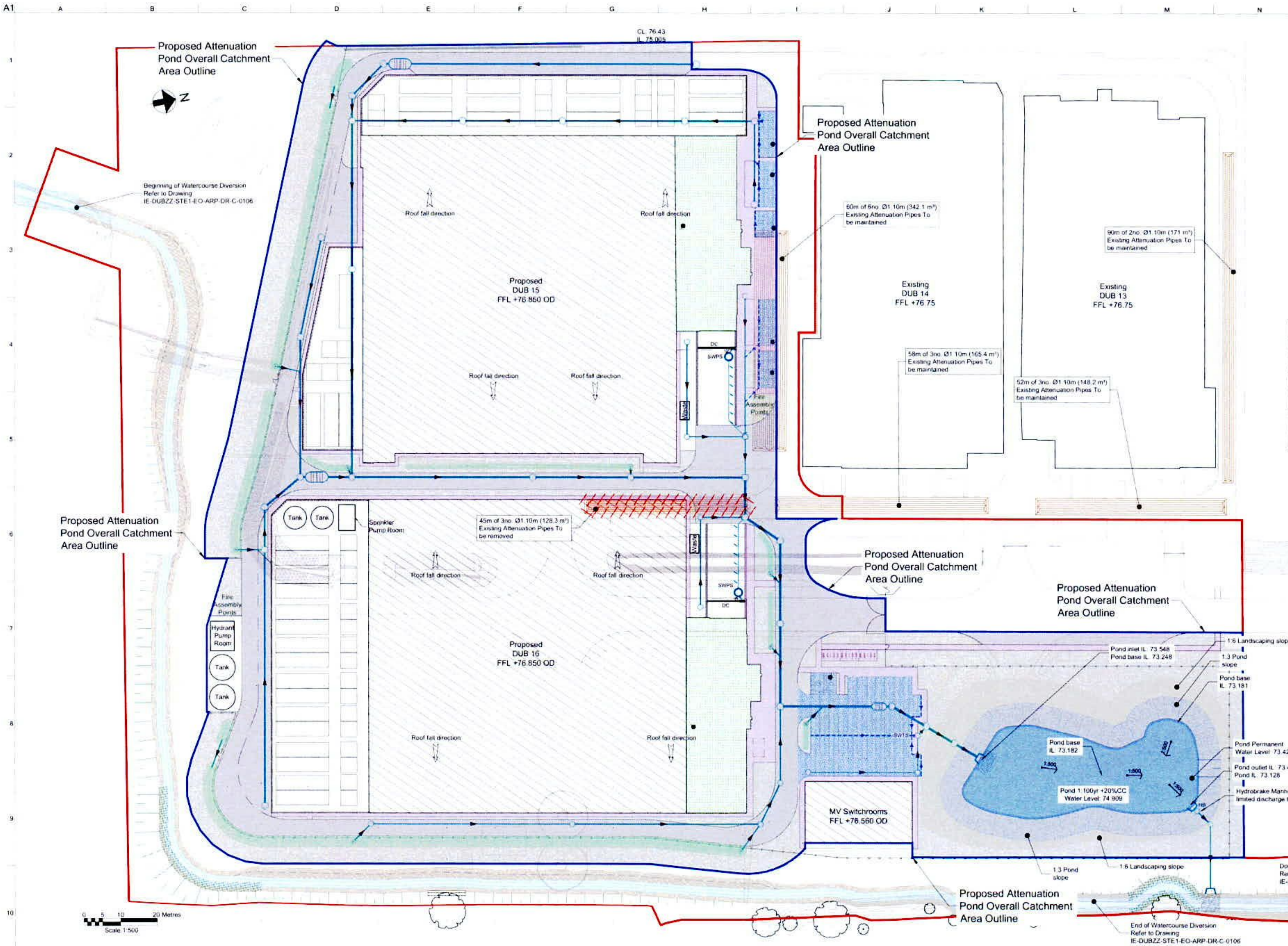
Therefore, comparing the volume provided by the proposed SuDS features of **2708.8 m3** and the volume required for the related development of **2498.0 m3**, all the attenuation can be achieved by the Sustainable Drainage Systems plus the development would have additional storage capacity, thereby be provided of further climate resilience.

Nevertheless, the storage capacity of the proposed pipes and manholes that comprise part of the Surface Water Network have not been included in the calculation above, which ultimately further strengths the climate resilience of the development.

Please see Appendix A for Proposed Attenuation Pond Catchment Area drawing. The attenuation pond catchment area is outlined in blue.

Appendix A

Arup Proposed Attenuation
Catchment Area Drawing



Legend

- DUB15/16 Proposed Attenuation Pond
- Pond 1:3 Slope Extent Accommodating 1:100yr+20%CC rainfall event + free board
- Landscape 1:6 Slope Extent from top of pond
- Existing Attenuation Tank
- Overall Catchment Area
- Roof Catchment Area
- Green Roof Catchment Area
- Road Catchment Area
- Concrete Catchment Area
- Footpath Catchment Area
- Permeable Carpark Catchment Area
- Landscape Catchment Area

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	40537.5	**0.81**

Proposed Pond will cater only for area outlined in blue. No run-off from existing development will go through Proposed Pond. The run-off from existing development will be collected and attenuated by existing drainage system.

Rev	Date	By	Chkd	Appd
C01	24/05/22	CDS	CDS	JMAC
	Issued for Planning RFI Response Clarification			

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Client: Digital Netherlands VIII B.V. (Netherlands)

Project Title: INXN DUB15/16

Drawing Title: Proposed Attenuation Pond Catchment Areas

Scale at A1: 1:500

Role: Civil

Suitability: Planning RFI Response

Arup Job No: 280503-00

Rev: C01

Name: IE-DUBZZ-STE1-EO-ARP-DR-C-0140

Do not scale